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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/771,557	01/30/2001	Yasuo Nomura	202489US6	9407

22850 7590 10/19/2006

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EXAMINER

VENT, JAMIE J

ART UNIT	PAPER NUMBER
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2621

DATE MAILED: 10/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/771,557

Applicant(s)

NOMURA ET AL.

Examiner

Jamie Vent

Art Unit

2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input checked="" type="checkbox"/> Other: <u>copy of application 09/150,235</u> . |

DETAILED ACTION

Response to Arguments

Applicant's arguments filed August 3, 2006 have been fully considered but they are not persuasive. Applicant argues on pages 2-3 that Hashizume et al (US 2003/0142955) does not have priority of current application as it claims priority to abandoned parent application 09/150,235. Please find enclosed the application 09/150,235 that establishes the priority of the Hashizume et al (US 2003/0142955) reference to September 10, 1998. The rejection is maintained.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4-6 are rejected under 35 U.S.C. 102(a) as being unpatentable by Hashizume et al (US 2003/0142955) in view of Seo (US 6,798,980).

[claims 1, 5, and 6]

In regard to Claims 1, 5, and 6 Hashizume et al discloses an information processing apparatus and method capable of copying image information recorded on a first recording medium onto a second recording medium, comprising:

- display control means for controlling displaying of a copying operation window which includes a first icon corresponding to the first recording medium, an image information icon corresponding to the image information recorded on the first recording medium and a second icon corresponding to the second recording medium (Figure 15 shows the display control means for displaying the various operations occurring in the system. The figure shows various recording mediums (recording medium 210, control computer 203, log image file unit 211 and 214 as further described in paragraphs 0048-0053);
- moving means for selecting and moving one of the at least one image information icons on the copying operation window (Figure 1 shows the operation of selecting and moving one of the image information in window copying or editing of the scene as further explained in Paragraph 0077-0079);
- determining means for determining of the moving means moves the one of the at least one image information icon to the second icon (Paragraph 0078-0080 describes the determining of moving icons and furthermore can be seen the determining of what icons are moved are controlled by the control computer 203 as seen in Figure 15);
- means for requesting a user input based on a result of the determining means (Paragraphs 0077-0080 describes the requesting of a user to determine the input result);

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- first setting means for setting whether or not a data format of the image moving means for selecting and information determined as an object of copying by moving means should be converted based on the user input (Figure 15 shows the control computer set the data format as further described in Paragraph 0009, 0018, and 0048-0049);
- readout means for reading out the image information corresponding to the one of the at least one image information icon selected by said moving means from the first recording medium (Figure 16 step 1008 reads out image information corresponded to the selected video image);
- writing means for writing the image information read out by said readout means or the image information converted by said conversion means onto second recording medium based on the setting of said first setting means (Figure 16 step 1010 write the image information that is read out of the system); however fails to disclose conversion means for converting the data format of the image information read out by said readout means based on the setting of said first setting means.

Seo discloses an apparatus wherein the audio/video data is converted for storage of information as seen in Figure 1. Furthermore, as described in Column 3 lines 35+ the converter is used to allow for proper storage and displaying of the data as it is being processed. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the information process apparatus as disclosed by

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Hashizume et al and further incorporate a conversion means for converting data format, as disclosed by Seo.

[claim 2]

In regard to Claim 2, Hashizume et al discloses an information processing wherein the first recording medium is built in said information processing apparatus, and the second recording medium is an external storage medium which can be removably connected to said information processing apparatus (Figure 15 displays various recording medium furthermore as described in Paragraph 0007 the recording mediums that are present can be removable (i.e. magnetic disk)).

[claims 3, 7,8,9,10,11]

In regard to Claim 3, 7,8,9,10,11, Hashizume et al discloses an information processing apparatus; however, fails to disclose that the conversion means converts the data format of the image information from that of the MPEG 2 system to that of the MPEG 1 system or MPEG 1 system to MPEG 2 system. Seo describes in Column 3 Lines 35+ the conversion of MPEG 2 to an MPEG 1 system and thereby provides a method for down converting the MPEG standard. This process is done to provide backward compatibility in order to provide output for older MPEG systems in the form of MPEG 1. Furthermore, it is well known in the art to convert MPEG 1 to an MPEG 2 system to upgrade the current data of the system. Both types of conversion provide compatibility within the system that has two standards present. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the information processing apparatus, as disclosed by Hashizume et al, and further

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incorporate a conversion of MPEG in the system to allow for greater use through various systems, as disclosed by Seo.

[claim 4]

In regard to Claim 4, Hashizume et al discloses an information processing apparatus according to claim 1, further comprising second setting means for setting whether or not the image information of an original determined as the object of copying should be deleted, and deletion means operable in response to a result of the setting of said second setting means for either deleting or placing into a disabled state the image information of the original of the object of copying recorded on the first recording medium after the processing of said writing means is completed (Figure 16 shows that once the information is read out that the video signal is overwritten to record additional data and thereby deleting the current recorded data).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jamie Vent whose telephone number is 571-272-7384. The examiner can normally be reached on 7:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thai Tran can be reached on 571-272-7382. Effective July 15, 2005, the Central Fax Number will change to 571-273-8300. Faxes sent to the old number (703-872-9306) will be routed to the new number until September 15, 2005.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jamie Vent


THAI Q. TRAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

AN APPARATUS FOR DETECTING ABNORMALITY OF A VIDEO SYSTEM,
ITS METHOD, AND RECORDING MEDIUM STORING THE METHOD

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to an apparatus
for detecting abnormality of a video system which
records, reproduces, and edits video data such as tele-
5 vision broadcast program video sources and video images.

Description of the Related Art

Television broadcast program generating
facilities and video program generating facilities are
now being provided with highly sophisticated functions by
10 computers which control various functions. In generating
a program, a moving image editing system and an image
editing method suitable for the moving image editing
system are used, the moving image editing system being
constituted of a video recording/reproducing apparatus
15 capable of digitally processing audio and video data
having a randomly accessible hard disk as a recording
medium for storing data.

In the moving image editing system having a
hard disk as the recording medium, various functions are
20 controlled by a computer. With the moving image editing
method, image information of moving images made of audio
and video data is edited through software by displaying
windows on a display connected to the computer. The
windows contain necessary editing control information

such as operation buttons and editing data display boxes for controlling the moving images to be edited and the video system itself.

A general video system using a computer will be described with reference to Figs. 2, 3, 4 and 7. Fig. 2 is a block diagram showing an example of the structure of a conventional video system. In this drawing, a broad arrow indicates a video signal line, and a narrow arrow indicates a control signal line. In Fig. 2, reference numeral 201 represents a video reproducing apparatus, reference numeral 202 represents a first monitor, reference numeral 203 represents a control computer, reference numeral 204 represents a display, reference numeral 205 represents a keyboard, reference numeral 206 represents a mouse, reference numeral 207 represents a video recording/reproducing apparatus, reference numeral 208 represents a video source such as a video cassette tape, reference numeral 209 represents a second monitor, reference numeral 210 represents a video recording medium such as a magnetic disk, reference numeral 211 represents a log file unit, reference numeral 200 represents a video signal cable, and reference numeral 212 represents an output video signal. The control computer 203 is connected to the video reproducing apparatus 201, video recording/reproducing apparatus 207, log file unit 211, display 204, keyboard 205, and mouse 205. The video source 208 is connected to the video reproducing apparatus 201, the first monitor 202 is connected to the

video reproducing apparatus 201 via the video signal cable 200, the video recording medium 210 is connected to the video recording/reproducing apparatus 207, and the second monitor 209 is connected to the video recording/reproducing apparatus 207 via the video signal cable 200. The video reproducing apparatus 201 and video recording/reproducing apparatus 207 are connected by the video signal cable 200.

These devices other than the video source 208, video reproducing apparatus 201, and first monitor 202 are in some cases configured as an integrated video editing system. These devices may be configured to be connected via interface to the control computer 203. An output video signal 212 from the video recording/reproducing apparatus 210 is supplied to a broadcasting apparatus (not shown) for on-air or supplied to another video system.

The control computer 203 shown in Fig. 2 controls the operation of the video system by using software. The video reproducing apparatus 201 reproduces images from the video source 208. An image reproduced by the video reproducing apparatus 201 is supplied to the first monitor 202 and video recording/reproducing apparatus 207. The first monitor 202 displays the reproduced image. The video recording/reproducing apparatus 207 records the input image in the video recording medium 210. The video recording/reproducing apparatus 207 reproduces images recorded in the video

recording medium 210 and sends them to the second monitor 209 which displays the images. The control computer 203 has as its peripheral devices the display 204, keyboard 205, mouse 206, and log file unit 211. The control

5. computer 203 controls the video system by displaying an operation/control screen on the display 204 by using graphical user interface (hereinafter called GUI) which substitutes for the functions of push buttons and the like. An operator uses either the keyboard 205 or mouse

10 206 to enter an operation/control instruction on the operation/control screen.

Fig. 3 shows an example of the operation/control screen displayed on the display 204 by using GUI. Reference numeral 30 represents an operation/control

15 screen, reference numerals 302-1, 302-2, and 302-3 represent windows such as a message window and a dialog window displayed on the operation/control screen 30, reference numeral 301 represents a push button displayed in the window 302-1 as a graphic component. In the

20 example shown in Fig. 3, the dialog box window 302-3 is displayed in front of the message window 302-2. The message window 302-3 may be displayed in front of the dialog box window 302-3 by moving a cursor of the mouse 206 into an area of the message window 302-2 and clicking

25 the mouse 206. Moving the window to the front or rear or to another position is a feature of a message window. Clicking is an operation of, for example, pushing a predetermined one of push buttons of the mouse 206 after

a pointer such as a cursor is placed on the push button 301 on the operation/control screen 30 displayed on the display 204 by using GUI. The operation/control screen displayed on the display and operated upon by using a
5 pointing device 206 such as a mouse and a track ball, is called a message window. A specific key of the keyboard 205 is assigned for the push button operation. Therefore, the clicking operation can be performed also by depressing this specific key. The operator uses the
10 video system by using either the pointing device or the keyboard 205.

The control computer 203 controls the video reproducing apparatus 201 and video recording/reproducing apparatus 207 by connecting them with a network control
15 cable (e.g., RS-422A standard interface).

Fig. 7 shows an example of a message window used for displaying a message regarding a current control state of the video system. Reference numeral 71 represents a message regarding the system state, reference
20 numeral 72 represents a schematic graph showing a progress state of the system, reference numeral 73 represents a button for cancelling an instruction, and reference numeral 70 represents a message window on which a message regarding the system state is displayed. This
25 message window is displayed on the operation/control screen 30.

Fig. 4 shows an example of a message window for displaying a message regarding an abnormality state.

Reference numeral 401 represents a message (error message) regarding an abnormality state, reference numeral 402 represents an abnormality display mark for drawing an operator's attention or for indicating a
5 degree of abnormality, and reference numeral 40 represents the message window or an error message screen for displaying the message 401 regarding the abnormality state. This message window is also displayed on the operation/control screen 30. Reference numeral 403
10 represents a push button which is pushed to close the error message screen 40 after the message 401 is checked.

When the contents of the video source 208 (e.g., video tape) are to be dubbed to the video recording medium 210 (e.g., hard disk), an operator
15 performs the following works.

First, the video source 208 is made reproducible by the video reproducing apparatus 201. The video recording medium 210 is made recordable by the video recording/reproducing apparatus 207. A dubbing
20 start push button on the message window, for example the operation/control screen 30 (Fig. 3) displayed on the display 204 is clicked to start dubbing.

In order to allow the operator to check whether the dubbing is being performed normally, the window 40
25 (Fig. 4) with the error message 401 regarding the abnormality state is displayed in a pop-up manner to inform the abnormality state to the operator. For example, if the dubbing is not performed in a

predetermined time after the control computer 203 instructs a dubbing operation from the video source 208 to the video recording medium 207, it is judged to be the abnormality state and the error message 401 "CANNOT
5 RECORD" is displayed.

The control computer 203 not only displays the monitored results on the operation/control screen 30, but also writes the monitored results in the log file unit 211 for use them as the past record. The log file unit
10 211 stores a control instruction issued by the control computer 203, all contents of the communication such as responses from the video reproducing apparatus 201 and video recording/reproducing apparatus 207, and time and date when an error occurs, in the order of error occur-
15 rence and in the text format. It is not necessary for an operator to always look at the operation/control screen 30 in order to monitor the video system state. Specifically, even if the operator moves from the video system to another site, the operator can confirm the contents of
20 the log file unit 211 later to check the video system state while the operator moved to the other site. For example, even if the error message screen 40 on the operation/control screen 30 of the first monitor 202 is displaying the error message "CANNOT RECORD" when the
25 operator returns to the video system, the operator cannot know at what time the recording became unable because the operator did not look at the reproduced images on the first monitor 202. However, the log file unit 211 stores

information on when the instruction issued by the control computer 203 was acknowledged normally and on when the abnormality state began. The operator can therefore know when the abnormality state began. This confirmation by
5 the operator can be performed as desired in order to prevent any miss of checking an abnormality of a control state while the operator is at the video system.

In this video system, no dubbing error concerning picture quality is recorded therein. Accord-
10 ingly, if it is necessary to check the picture quality of the recorded moving images, the operator must watch the whole moving images by replaying the recording medium by video recording/reproducing apparatus. The operator must also replay the recording medium and watch the reproduced
15 video image in order to check the start point of the necessary re-recording operation, when there arise the troubles such as an incomplete dubbing due to excess of video data amount over the capacity of recording medium, and an unexpected disconnection of the signal cable. In
20 most cases, the re-recording of the moving images must be made from the start thereof.

If the dubbing operation is completed normally, the operator reproduces sequentially or fast-forward the images of the video recording medium 210 on the second
25 monitor to visually confirm whether the images were not disturbed by noises or the like, and check the reproduction state of the images and the record state thereof.

An example of a computer aided video system

shown in Fig. 2 is disclosed in "Avid News Cutter 3.0 User's Guide, August 1994, Chapter 3", pages 31-32, 35, 49, 51-54, 102, Chapter 5, pages 105, 349. This document discloses that an error event occurred during the
5 recording/reproducing operation is stored in a message text format and it can be later output as a log. This document also describes setting an IN point or an editing start point and an OUT point or an editing end point. This document does not disclose, however, recording
10 images with an error event and displaying these images.

With the conventional method for monitoring the control state of a video system, the control state is displayed on the screen and an instruction executed by the video system is stored as a past record. Therefore,
15 it is not necessary for an operator to always monitor the video system, and the operator can check the recorded contents whenever the operator wishes. The work amount of the operator can therefore be reduced.

However, the stored record contents are only
20 text information of an instruction the control computer issued to each device and a response from the device. Therefore, the image quality including the state of reproduced images and the abnormality state of recorded images such as image disturbance by noises, lost colors,
25 and synchronization fluctuation, cannot be checked unless the operator actually looks at the replayed images from the beginning to the last.

If there is an abnormality to be caused by

external factors of the video system, such as disconnection of a video signal cable, video signals cannot be recorded correctly so that discrimination between abnormality states is difficult. Because of these
5 problems, in order to check whether the images were recorded correctly, the operator is required to actually replay the images and visually confirm them. It takes therefore a long time for the operator to inspect the control state of the video system, and at the worst some
10 errors are failed to locate, resulting in a serious broadcasting accident. Still further, if a subliminal image is inserted, this image cannot be identified by an operator at an ordinary replay speed.

SUMMARY OF THE INVENTION

15 The invention provides an apparatus for detecting abnormality of a video system for reproducing, recording and editing moving images capable of automatically detecting an abnormality state of the video system or images in accordance with the reproduced images
20 and recording the reproduced images detected as in the abnormality state and displaying the images on a display screen, and provides a use method for the video system. The invention also provides an editing system and its use method used with such a video system, capable of easily
25 setting and changing editing positions.

In the apparatus and method of this invention, an abnormality state of images or the video system is

detected from moving images reproduced from a video recording medium, the image detected as in the abnormality state is stored as a still image in a storage device, and the still image detected as in the abnormality state is read from the storage device and displayed on a display screen.

In a moving image editing system and its editing applied this invention, it is possible to set variables of three variable items including an IN point representative of an editing start position of the moving images, an OUT point representative of an editing end position, and an interval between the editing start point and the editing end point. If the set value of the variable is changed, a fixed variable item whose set value is maintained unchanged, among the variable items whose set values are not changed, is designated so that the value of a remaining variable item can be automatically calculated and set again.

A computer program product of the invention provides a recording medium storing program code means embodying sequences of detecting abnormality of the video system or editing method in the computer readable format.

According to one aspect of the present invention, a control computer monitors the recording/reproducing state of images through image recognition to automatically detect a change point of scenes or an abnormality state of images. A still image of the moving image detected as in the abnormality state is acquired

and displayed on the screen of a display, and is stored as a log file.

As a video signal is supplied to the control computer, it monitors the recording/reproducing state of
5 images, and a change point of scenes or an abnormality state of images is detected by using software. The detected image data is displayed on the screen of a display and stored in a storage device.

An operator can check an abnormality of the
10 recording/reproducing state of actual moving images by searching from a series of still images.

According to another aspect of the present invention, means is provided for instructing to select either the item whose value is automatically set or the
15 item whose set editing point value is maintained unchanged and is not automatically set. By utilizing this means, a moving image editing method can be provided which can efficiently set editing points.

BRIEF DESCRIPTION OF THE DRAWINGS

20 Fig. 1 is a diagram showing an example of a log image display window of an apparatus according to an embodiment of the invention.

Fig. 2 is a block diagram showing an example of the structure of a video editing system.

25 Fig. 3 is a diagram illustrating an example of operations to be executed by the video editing system using GUI.

Fig. 4 is a diagram showing an example of an error message window.

Fig. 5 is a flow chart illustrating software for monitoring the video system of the embodiment of this invention.

Fig. 6 is a diagram illustrating examples of operations to be executed by the embodiment using GUI of this invention.

Fig. 7 is a diagram showing an example of a message window for displaying a message regarding a current state of the video system.

Fig. 8 is a block diagram showing an example of the structure of a video editing system according to an embodiment of the invention.

Fig. 9 is a diagram showing another example of an error message window of the embodiment of this invention.

Fig. 10 is a diagram showing an example of an operation panel window displayed on a display of a moving image editing system.

Fig. 11 is a flow chart illustrating a general sequence of setting editing points.

Fig. 12 is a diagram illustrating a priority order of editing point setting items.

Fig. 13 is a diagram showing an example of an operation panel screen displayed on a display of a moving image editing system using a moving image editing method according to an embodiment of the invention.

Fig. 14 is a flow chart illustrating the operation of setting editing points by a moving image editing method according to an embodiment of the invention.

5 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Sub
A

10 An embodiment of the invention will be described with reference to Figs. 1, 4, 5, 6, 8, and 9. Fig. 8 is a block diagram showing an example of a video editing system embodying the invention. In Fig. 6, reference numeral 213 represents a switcher and reference numeral 214 represents a log image file unit. Other devices are represented by reference numerals identical to those of the conventional structure shown in Fig. 2. A control computer 203 is connected to a video repro-

15 ducing apparatus 201, a video recording/reproducing apparatus 207, the switcher 213, a log file unit 211, the log image file unit 214, a display 204, a keyboard 205, and a mouse 206. A video source 208 is connected to the video reproducing apparatus 201 which is connected via

20 video signal cables 10 to a first monitor 202 and the switcher 213. A video recording medium 210 is connected to the video recording/reproducing apparatus 207 which is connected video signal cables 10s to a second monitor 209 and the switcher 213. The switcher 213 is connected via

25 a network control cable and a video signal cable 200 to the control computer 203.

Referring to Fig. 8, the control computer 203

controls the operation of the video editing system by using software. Upon instruction by the control computer 203, the video reproducing apparatus 201 reproduces images from the video source 208 and sends the images to the first monitor 202 and switcher 213. The first monitor 202 displays the reproduced image. The switcher 213 sends the image input from the video reproducing apparatus 201 to the video recording/reproducing apparatus 207 which records the input image in the video recording medium 210. The video recording/reproducing apparatus 207 reproduces images recorded in the video recording medium 210 and sends them to the second monitor 209. The video recording medium 210 stores video data supplied from the video recording/reproducing apparatus 207. Upon instruction by the control computer 203, the video recording/reproducing apparatus 207 reproduces images from the video recording medium 210 and sends them to the second monitor 209 and switcher 213. The second monitor 209 displays the supplied images. Upon instruction by the control computer 203, the switcher 213 performs the following operations to switch between video signal paths:

(1) sending an image entered from the video reproducing apparatus 201 to the video recording/reproducing apparatus 207;

(2) sending an image entered from the video recording/reproducing apparatus 207 to the control computer 203; and

(3) sending an image entered from the video reproducing apparatus 201 to the control computer 203.

With this switching operations, each of the operations (1) to (3) may be executed independently or
5 the operations (1) and (2) or the operations (1) and (3) may be executed at the same time. The video recording/reproducing apparatus 207 is realized by a video server system wherein video images are reproduced after recording thereof with a delay, for example a few seconds
10 or more depending on the type of video server system. The control computer 203 has as its peripheral devices the display 204, keyboard 205, mouse 206, and log file unit 211. The display 204, keyboard 205, mouse 206 and log file unit 211 have the functions similar to the
15 conventional techniques. The log image file unit 214 stores therein still images. The control computer 203 monitors an image entered from the switcher 213 by using software stored in a memory of the control computer 203 to detect a scene change point, image disturbance by
20 noises, a presence/absence of a subliminal image and the like and store a still image added with a time code representative of the time when the change point or noises are detected, in the log image file unit 214 as video log data. The detecting software will be described
25 later. A GUI operation/control screen is displayed on the display 204. If a log image is to be viewed, a log image display push button displayed on the GUI operation/control screen on the display 204 is clicked to

pop up the top window with log images.

A method of deriving an image at a scene change point is disclosed, for example, in JP-A-8-227462 or JP-A-4-111181. With this method of JP-A-111181, a scene
5 change point is detected through image recognition by a computer. A presence-absence of a subliminal image is judged in the following manner. If an interval between adjacent change points detected by a scene change point detecting process is one frame or several frames for
10 example, it is judged that a subliminal image is being inserted. On the other hand, if an interval between adjacent change points detected by the scene change point detecting process is extraordinarily longer than a standard value, it is judged that a connection cable is
15 disconnected or broken.

Detecting software and circuits are provided for detecting an abnormality state such as noises in a reproduced image, a subliminal image, defective video signals, and wire disconnection of the video system. The
20 detecting software may be configured as in the following. A correlation between a subject frame and an adjacent frame is obtained and an abnormal image state is detected in accordance with the correlation. A subject frame is divided into a plurality of regions, a histogram of image
25 data in each region is obtained and an abnormal image state is detected in accordance with the histogram. A state of a specific signal in video signals of a subject frame is detected and an abnormal image state is detected

in accordance with the detected state. If the same image continues for a predetermined time or longer, an occurrence of abnormality is judged. As described previously, if an interval between adjacent change points is shorter
5 or longer than a predetermined standard length, an occurrence of abnormality is judged. These abnormality detecting methods are performed, for example, by using moving images reproduced from the video recording medium
210 such as a magnetic disk.

10 Fig. 6 shows an example of a message window displayed on the display 204. Reference numeral 60 represents an operation/control window. Reference numeral 600 represents a dubbing start push button, reference numeral 601 represents a video reproduction
15 display area, reference numeral 602 represents a video signal switching button area, reference numeral 603 represents a log image display button for instructing to display a log image, and reference numeral 604 represents a video reproduction operation unit.

20 Reference numeral 610 represents an operation window for instructing to reproduce, record and edit video data. Reference numeral 605 represents a window in which a log image is displayed. Reference numeral 606 represents a series of M-icons for reproduced images
25 currently being monitored. Reference numeral 607 represents text information indicating attributes (e.g., broadcast day and time, title and the like of images) of images to be monitored.

When the contents of the video source 208 (e.g., video tape) are to be dubbed to the video recording medium 210 (e.g., hard disk) capable of recording/reproducing video data, an operator clicks the dubbing start push button 600 on the operating control window displayed on the display 204 to thereby instruct the control computer 203 to start dubbing. The control computer 203 supplies a dubbing control instruction to the video reproducing apparatus 201 and video recording/reproducing apparatus 207. While the video recording/reproducing apparatus 207 records images in the video recording medium 210, it also reproduces the recorded images which are input via the switcher 213 to the control computer 203. The control computer 203 starts monitoring the input images.

Fig. 5 is a flow chart illustrating an example of software for monitoring the video system to detect a scene change point and noises.

The control computer 203 starts monitoring input images (Step 501), acquires an image and a time code of each frame (Step 502).

Next, it is checked whether noises are detected in the image. If not, the flow advances to Step 506, whereas if detected, the flow advances to Step 504 (Step 503).

At Step 506 it is checked whether the image is at the scene change point. If at the scene change point, the flow advances to Step 507, whereas if not, the flow

returns to Step 502 (Step 506).

At Step 504, since noises were detected, an alarm is issued to make the operator be attended (Step 504). The noise detected image and time code are stored
5 in the log image file unit 214 as a noise detection point (Step 505).

After Steps 505 and 507, it is checked whether all images have been processed. If not, the flow returns to Step 502, whereas if processed, the flow advances to
10 Step 509 (Step 508).

Monitoring images are terminated at Step 509 (Step 509).

In addition to the noise detection described above, other image quality checks such as detecting a
15 subliminal image can be performed in the manner similar to the above.

In order for the control computer 203 to issue an alarm at Step 504 and make the operator be attended, a window 40' with a message 401' "NOISES WERE DETECTED.
20 CHECK" indicating an abnormality state is displayed in the operating control window as shown in Fig. 9, while alarm sounds notifying the abnormality state are generated. After confirming the message 401', the operator depresses a push button 403' close the alarm
25 message window 40'. When other abnormality states occur, such as those described with the conventional techniques, the window 40 (Fig. 4) with the error message 401 (Fig. 4) notifying the abnormality state to the operator is

displayed in a pop-up manner while alarm sounds are generated from the control computer 203. Not only alarm sounds but also other means such as light and vibrations sensible to the operator, or a combination thereof may be used. The type, time, and the like of the detected abnormality state may be stored in a text format not only in the log image file unit 214 but also in the log file unit 211. In this case, the abnormality state can be diagnosed more reliably in association with abnormality states of the video system before and after noises or the like are detected, by referring to the contents of the log file unit 211. An alarm for the abnormality state can be monitored remotely if the video system is connected to the Internet or LAN.

After or during the dubbing, the operator looks at the log image in order to check the quality of images recorded in the video recording medium 210. To this end, the operator clicks with the mouse 206 the log image display push button 603 in the GUI operation/control window 60 displayed on the display 204. The log image display window is displayed on the top of the GUI operation/control window 60. Log image data recorded in the log image file unit 214 is displayed in the log image display window 605.

Fig. 1 is a diagram illustrating an example of a log the message window displayed a log image display window displayed on the display 204. In Fig. 1, reference numeral 605 represents a log image display

window, reference numerals 101-1, 101-2, 101-3, 101-4, 101-5, 101-6, 101-7, and 101-8 represent a series of still images stored in the log image file unit 214, and reference numerals 102-1, 102-2, 102-3, 102-4, 102-5, 102-6, 102-7, and 102-8 represent time codes "Hour: Minute: Second: Frame number" indicating the detection position information. For example, the time code 102-1 "00:00:02:13" indicates 2 seconds after the start of work and the thirteenth frame. Reference numeral 103 represents a color frame added to a noise detected image 101-5 among the series of still images 101-1, 101-2, 101-3, 101-4, 101-5, 101-6, 101-7, and 101-8. Reference numeral 104 represents a button for closing the log image display window 605, and reference numeral 105 represents a scroll bar. The series of still images 101-1,... are displayed as many as they can be displayed within an area of the log image display window 605, in the order of detection time. In the example shown in Fig. 1, eight images are displayed at the same time on the log image display window 605. The images smaller than eight images are displayed at the same time, and the images larger than eight images can be checked by scrolling them up and down by using the scroll bar 105 so that the operator can check all the log images.

Next, the operator checks the log images displayed on the log image display window 605 and selects the log image to check the quality of the corresponding image stored in the video recording medium 210.

In order to check the image quality, the control computer 203 operates to display reproduced images on the image reproduction display area 601 in the GUI operation/control screen 60 displayed on the display

5 204. Images displayed on the image reproduction display area 601 are reproduced by the video reproducing apparatus 201 or video recording/reproducing apparatus 207 which is selected by the switcher 213. The video signal is switched by the operator with the switch button

10 group 602. For example, if images from the video reproducing apparatus 201 are to be viewed, a check mark is entered in a display box "A" of the switch button group 602, whereas images from the video recording/reproducing apparatus 207 are to be viewed, a

15 check mark is entered in a display box "B" of the switch button group 602. In the example shown in Fig. 6, since the check mark is entered in the display box "A" of the switch button group 602, images reproduced by the video reproducing apparatus 201 are displayed on the display

20 area 601. The operator can check images displayed on the display area 601 precisely by manipulating a button group of the video reproduction operation unit 604 to "reproduce", "feed fast forward", "feed backward", "stop", or "shuttle" the images.

25 As described above, with the video editing system of this invention, for example, even if the operator moves to another site until the dubbing is completed and thereafter returns, a noise detected image

can be known from the message window 40 or log image display window 605 on the GUI operation/control screen 60 without visually confirming all the images. When the image 101-4 emphasized by the color frame 103 shown in

5 Fig. 1 is clicked, the control computer 203 operates to search and reproduce images from the medium selected by the switch button group 602. Therefore, the operator changes the switch button group 602 to "B" to check the images on the second monitor 209. If there are noises in

10 images, the operator changes the switch button group 602 to "A" to view images on the first monitor 202 to check whether noises are in the video source 201. In this manner, whether noises are in the video recording medium 207 or in the video source 201 can be determined quickly.

15 The image quality can be checked more precisely, not only from the images displayed on the image reproduction display area 601 on the display 204, but also from the images on the first and second monitors 202 and 209 linked with the selected log image via the video

20 reproducing apparatus 201 and video recording/reproducing apparatus 207.

Other abnormality states such as a subliminal image, a cable disconnection, and a broken cable can be automatically detected in a manner similar to the noise

25 detection. In this case, log images are added with a color frame or graphic design frame different from a color frame of a noise detected image. Since images together with time codes in an abnormality state or a

state which may change to the future abnormality state can be automatically detected, the images can be checked as many times as desired, irrespective of whether or not the operator moves to another site. It is obvious that

5 in order to discriminate between the types, urgency degrees, and operator requirements of abnormal images, the width, shape, color (white, black, transparent color, etc.), and graphic design of a frame added with a log image can be used in combination. A log image may be

10 emphasized by other symbols and shapes different from frames.

If there is a subliminal image, the scene change point of the next image occurs quickly, whereas if a connection cable of the video system is dismantled or

15 if images on the tape are finished, the scene change point does not occur for a long time and the log image becomes, for example, single blue color. It is therefore possible to detect an abnormality state quickly, to identify necessary images from the position of the log

20 still image, and to provide a countermeasure for these images. A phenomenon that pictures of several lines are held into black region when a DC clamp of a video signal is lost can be detected easily with the detection software described earlier. Furthermore, phenomena such

25 as lost color and loss of only red, and image disturbance caused by synchronization fluctuation can be detected in a similar manner so that the operator viewing the log images can know it quickly.

As described above, if the quality of recorded images is poor, it is possible to determine quickly whether the quality of the video source is poor or whether the recording/reproducing operation for the video source had any problem. If the quality of the video source is poor, the video source is replaced. If the recording/reproducing operation has any problem, this problem is dealt with.

Controlling the video system and executing the state monitoring method described above may be performed by programs stored in a recording medium. A recording medium storing process sequences of the state monitoring method may be various types of media such as a floppy disk, a compact disk, and an optical disk.

As described above, according to the present invention, a scene change point of input images and image disturbance caused by noises are automatically detected by software, and a still image at the scene change point and a still image with disturbance by noises are stored in the log file. Accordingly, those images reproduced or recorded in the past can be checked later from the log file.

The second advantage of the invention is as follows. If a connection cable of the video system is disconnected or if images on the tape are finished, the scene change point does not occur for a long time and the log image becomes, for example, single blue color. The operator can therefore detect an abnormality state

quickly by watching the log image, to identify necessary images from the position of the log still image, and to provide a countermeasure for these images.

Reproduction is possible even during image
5 recording, by using as the video recording medium 207 a recording medium (e.g., hard disk) capable of random access. In this case, without stopping the image recording operation, a desired position of the recording medium can be reproduced. Accordingly, if noises are
10 detected even during the image recording, these images can be checked without stopping the image recording.

The third advantage of the invention is as follows. A phenomenon that pictures of several lines are held into black region when a DC clamp of video signal is
15 lost and phenomena such as lost colors and loss of only red can be detected by the operator watching the log image. It is therefore possible to identify necessary images from the position of the log still image, and to provide a countermeasure for these images.

20 The fourth advantage of the invention is as follows. A subliminal image can be detected by software. It is therefore possible to identify necessary images from the position of the log still image, and to correct these images.

25 The fifth advantage of the invention is as follows. Synchronization fluctuation can be detected by an operator watching the log image. It is therefore possible to identify necessary images from the position

of the log still image, and to again record these images.

The sixth advantage of the invention is as follows. In a non-linear video system, reproduction is possible even during image recording. It is therefore
5 possible to check images during image recording by an operator watching the log image. Even if images are not always monitored, only those images in the abnormality state can be detected during image recording. It is therefore possible to efficiently check the work
10 progress, image reproduction, and image recording.

The apparatus of the present invention is applicable not only to the above embodiment, but also to a system which uses a magnetic tape as a recording medium
210 of the video recording/reproducing apparatus 207.

15 Next, the video reproduction display area 601 and video reproduction operation unit 604 shown in Fig. 6 will be described in more detail. The video reproduction display area 601 and video reproduction operation unit 604 can be used not only for image recording/reproducing
20 but also for image editing.

An example of a window on a computer display used for determining an editing point of moving images is shown in Fig. 10. Fig. 10 is an enlarged view of a window including the video reproduction display area 601
25 and video reproduction operation unit 604.

An operation panel 610 is shown in the window displayed on the display 204. Moving images reproduced by the video recording/reproducing apparatus 207 can be

displayed in the image reproduction display area 601 of the operation window 610. Although an image is not shown in Fig. 10, an image is displayed during reproduction.

The operation button group 612 in the operation screen 610 such as a reproduction button, a feed fast forward button, and a feed backward button is used for controlling the video recording/reproducing apparatus. For example, if images recorded in the video recording/reproducing 207 are to be reproduced, a pointer is placed on a reproduction button 613 by using the mouse 206, and the mouse 206 is clicked. Then, moving images reproduced by the video recording/reproducing apparatus 207 are displayed on the image reproduction display area 601. A time code of the reproduced image stored in the recording medium is displayed on a time code display box 614.

An example of processes of a method of determining an editing point of moving images will be described, with reference also to Fig. 11. There are two methods of determining an editing point of moving images.

With the first method, images reproduced by the video recording/reproducing apparatus 207 and displayed on the image reproduction area 601 are monitored to search and determine a desired scene (position) to be edited and store the time code of the image of the desired scene. With the second method, a predetermined time code of a moving image of a desired scene is entered from the keyboard 205 (while the image corresponding to the entered time code is reproduced in some case), and

the entered time code is stored.

The first method of determining an editing point of moving images, i.e., a method of searching and determining an editing point while moving images displayed on the image reproduction area 601 on the display 204 are monitored, will be described.

First, push the button 613 of the operation button group 612 of the video recording/reproducing apparatus 207 by using the mouse 206, and the mouse 206 is clicked to make the video recording/reproducing apparatus enter a reproduction state and display moving images to be edited, on the image reproduction area 601 of the operation area 601 displayed on the display 204.

The reproduced moving images displayed on the image reproduction area 601 are monitored. When a desired image to be used as a start point (IN point) of the moving image to be edited is reproduced, push a pause button 615, and the mouse 206 is clicked. The reproduction is therefore stopped and the reproduced image displayed on the image reproduction area 601 enters a pause state.

In this pause state, push a frame forward reproduction button 616, a frame backward reproduction button 617, or push a shuttle function slider 618 to determine a correct IN point through frame advance or the like.

After the position of the IN point is determined, push an IN point setting button (Mark In)

619. The time code displayed in the time code display box 614 is therefore set as the IN point, and the time code in the time code display box 614 is copied to and displayed in an IN point display box 620. In this manner, an operation of setting one IN point is completed (refer to Step 701 in Fig. 11).

Next, push the reproduction button (Mark In) 619. The video recording/reproducing apparatus 207 is therefore set to the reproduction state so that the reproduced moving image is displayed on the image display area 601 of the operation area 601 displayed on the computer display 204 to thereafter set the end point (OUT point) of the moving image to be edited.

The reproduced moving images displayed on the image display area 601 are monitored. When a desired image to be used as the OUT point of the moving image to be edited is reproduced, push the pause button 615, and the mouse 206 is clicked. The reproduction is therefore stopped and the reproduced image displayed on the image display area 601 enters the pause state.

In this pause state, push to the frame forward reproduction button 616, frame backward reproduction button 617, or slide shuttle function slider 618 a correct OUT point through frame advance or the like.

After the position of the OUT point is determined, push an OUT point setting button (Mark Out) 621. The time code displayed in the time code display box 614 is therefore set as the OUT point, and the time

code in the time code display box 614 is copied to and displayed in an OUT point display box 622. In this manner, an operation of setting one OUT point is completed (refer to Step 702 in Fig. 11).

5 After the IN point and OUT point are set by the above operations, an interval (or called a duration) between the IN and OUT points, i.e., a time duration of moving images to be edited, is automatically calculated by the editing control computer 203 and displayed in an
10 interval display box 623. An operation of setting one interval is completed (refer to Step 703 shown in Fig. 11).

 The second method of determining an editing point of moving images, i.e., a method of determining an
15 editing point by placing the pointer on the desired display box among the IN point, OUT point, and interval display boxes to enter the time code from the keyboard 205, will be described.

 For example, if the IN point is to be set, the
20 pointer is placed on the IN point display box 320 by using the mouse 206 to enter from the keyboard 205 the time code representative of time information corresponding to the desired scene of moving images to be set as the IN point.

25 With this second method, the interval which can not be set directly with the first method can be entered directly from the keyboard 205.

 Both the first and second methods may be used

for setting editing points of moving images. For example, in setting the IN point, reproduced moving images displayed on the image display area 601 are monitored to determine a desired scene, and the time code
5 corresponding to the image at the desired scene is set to the IN point display box 620 and stored. In setting the OUT point, the time code of a moving image corresponding to a desired scene is directly entered from the keyboard 205.

10 The relation between the IN and OUT points and interval of the editing points satisfies an equation "interval = OUT point - IN point". Therefore, if the two items among the three items are determined, the remaining one item can be automatically calculated by the editing
15 control computer 203.

Therefore, it is not necessarily required to set both the IN and OUT points in order to determine the editing points. For example, if the IN point and interval are determined, the OUT point can be calculated
20 automatically by the computer 203.

If all the three items including the IN and OUT points and interval are set and one item is set again, one of the two items is automatically corrected by the editing control computer 203, this one item having a
25 lower priority order as shown in Fig. 12. The priority order No. 1 is the set IN point 10, No. 2 is the set OUT point 11, No. 3 is the interval 12, No. 4 is the automatically set IN point 13, and No. 5 is the automatically

set OUT point 14.

For example, assuming that in determining the editing points, the IN and OUT points are set and the computer 203 automatically sets the interval. The IN
5 point corresponds to the latest set IN point 10, the OUT points corresponds to the latest set OUT point 11, and the interval corresponds to the interval 12. If the interval is changed to a value larger by three frames, the latest set OUT point 11 has a priority order lower
10 than that of the latest set IN point. Therefore, the OUT point is automatically changed to a value larger by three frames, without changing the presently set IN point.

In the moving image editing method described above, as one of the items is changed after the IN and
15 OUT points and interval have already set, the item having the lower priority order is automatically changed. For example, if the IN point is changed, either the OUT point or interval is automatically changed. Which one of the items is selected depends upon the priority order if the
20 priority order has been preset.

Since the item selection depends upon the priority order, if there is an item which is not desired to be changed, this item is required to be memorized before the item, e.g., IN point, is changed. After the
25 item value is automatically changed, the memorized item is again entered.

If the priority order of the editing points to be changed is different from the priority order preset at

the moving image editing system, the item once set is required to be entered thereafter.

Another embodiment of a moving image editing method capable of solving the above problem and setting
5 the editing points of moving images, will be described.

Another embodiment of an editing screen displayed on the display of the moving image editing system by using the moving image editing method is illustrated in Fig. 13. An image of an operation window
10 800 shown in Fig. 13 is displayed in the GUI screen 60 as shown in Fig. 6.

Referring to Fig. 13, the operation window 800 used for determining an editing point of moving images is shown in the screen of the computer display 204. Moving
15 images reproduced by the video recording/reproducing apparatus 207 can be monitored in a display area 806 of the operation window 800. Although an image is not shown in Fig. 13, an image is displayed during reproduction.

Disposed on the operation window 800 are: an
20 operation button group 808 such as a reproduction button, a feed fast forward button, and a pause button used for controlling the video recording/reproducing apparatus 207; a time code display box 807 for displaying a time code on the recording medium corresponding to the image
25 reproduced on the image reproduction display area 806; an IN point display box 801 for displaying an IN point time code of the editing point; an IN point fixing toggle button 809 capable of setting the IN point of the editing

point differently from a preset priority order; an OUT point display box 802 for displaying an OUT point time code of the editing point; an OUT point fixing toggle button 810 capable of setting the OUT point of the

5 editing point differently from the preset priority order; an interval display box 803 for displaying a time interval between the IN and OUT points of the editing points; an interval fixing toggle button 811 capable of setting the interval differently from the preset priority

10 order; an IN point setting button 804; an OUT point setting button 805; and the like.

Similar to conventional techniques, with the first method of determining an editing point of moving images, images reproduced by the video recording/repro-

15 ducing apparatus 207 and displayed on the image reproduction display area 806 are monitored to search and determine a desired scene (position) to be edited and store the time code of the image of the desired scene. With the second method, a predetermined time code of an

20 editing point of a moving image of a desired scene is entered from the keyboard 205 (while the image corresponding to the entered time code is reproduced in some case), and the entered time code is stored. With the

25 moving image editing method of the invention, the IN and OUT point fixing toggle buttons 809 and 810 and interval fixing toggle button 811 are provided, and by operating upon one of the fixing toggle buttons, it becomes possible to set the item of the change point which is

automatically calculated and set again when the value of some item once set is changed.

If all of the IN and OUT point fixing toggle buttons 809 and 810 and interval fixing toggle button 811
5 are turned off, and when the value of some item once set is changed, one of the other two items is selected in accordance with the priority order and automatically calculated.

If one of the IN and OUT point fixing toggle
10 buttons 809 and 810 and interval fixing toggle button 811 is turned on and another item is changed, the value of the editing point for the turned-on fixing toggle button is maintained unchanged. Only one of the three fixing toggle buttons is allowed to be turned on at a time.

15 Specifically, for example, if OUT point fixing toggle button 810 is turned on after the IN point fixing toggle button 809 was turned on, the state of the previously turned-on IN point fixing toggle button 809 is changed to the off-state to give a priority to the later
20 turned-on fixing toggle button.

The maximum number of turned-off fixing toggle buttons is "3" and all the fixing toggle buttons can be turned off.

A method of determining an editing point of
25 moving images by using the IN and OUT point fixing toggle buttons 809 and 810 and interval fixing toggle button 811 will be described with reference also to Fig. 14.

In the initial state when determining the

editing point of moving images starts, all the IN and OUT point fixing toggle buttons 809 and 810 and interval fixing toggle button 811 are being turned off, and none of the editing points of the three items of the IN and
5 OUT points and interval are not being set (refer Step 900 in Fig. 14).

By using a reproduction button 813 of an operation button group 808 on the operation window 800 of the display 204, a feed fast forward, and a feed backward
10 button to make the video recording/reproducing apparatus 207 enter a reproduction state and display moving images to be edited, on an image reproduction display area 806 of the operation window 800 displayed on the display 204.

The reproduced moving images displayed on the
15 image reproduction display area 806 are monitored. When a desired image to be used as a start point (IN point) of the moving image to be edited is reproduced, push a pause button 814 by using the mouse 206, and the mouse 206 is clicked. The reproduction is therefore stopped and the
20 reproduced image displayed on the image reproduction display area 806 enters a pause state.

In this pause state, the pointer is moved to a frame forward reproduction button 815, a frame backward reproduction button 816, or a shuttle function slider 812
25 by using the mouse 206, and the mouse is clicked to determine a correct position of the IN point through frame advance or the like.

After the position of the IN point is

determined, the pointer is placed on an IN point setting button (Mark In) 804 by using the mouse 206, and the mouse 206 is clicked. The time code displayed in the time code display box 807 is therefore set as the IN
5 point, and the time code in the time code display box 807 is copied to and displayed in an IN point display box 801. In this manner, an operation of setting one IN point is completed, and the IN point is stored in a memory of the editing control computer 203 (refer to Step
10 901 in Fig. 14).

Next, the pointer is again placed on the reproduction button 813 by using the mouse 206, and the mouse 206 is clicked. The video recording/reproducing apparatus 207 is therefore set to the reproduction state
15 so that the reproduced moving image is displayed on the image reproduction display area 806 of the operation window 800 displayed on the computer display 204 to thereafter set the end point (OUT point) of the moving image to be edited.

20 The reproduced moving images displayed on the image reproduction display area 806 are monitored. When a desired image to be used as the OUT point of the moving image to be edited is reproduced, the pointer is placed on the pause button 814 by using the mouse 206, and the
25 mouse 206 is clicked. The reproduction is therefore stopped and the reproduced image displayed on the image reproduction display area 806 enters the pause state.

In this pause state, the pointer is moved to

the frame forward reproduction button 815, frame backward reproduction button 816, or shuttle function slider 812 by using the mouse 206, and the mouse is clicked to determine a correct position of the OUT point through
5 frame advance or the like.

After the position of the OUT point is determined, the pointer is placed on an OUT point setting button (Mark Out) 805 by using the mouse 206, and the mouse 206 is clicked. The time code displayed in the
10 time code display box 807 is therefore set as the OUT point, and the time code in the time code display box 807 is copied to and displayed in an OUT point display box 802. In this manner, an operation of setting one OUT point is completed and the time code is stored in a
15 memory of the editing control computer 203 (refer to Step 901 in Fig. 14).

After the IN point and OUT point are set by the above operations, an interval or a time duration between the IN and OUT points, i.e., a time duration of moving
20 images to be edited, is automatically calculated by the editing control computer 203 and displayed in an interval display box 803. An operation of setting one interval is completed and the interval is stored in a memory of the editing control computer 203 (refer to Step 902 shown in
25 Fig. 14).

By repeating the above editing operation, a desired program can be edited.

Consider for example an editing operation that

the IN point is changed (Step 903 in Fig. 14) and the OUT point is maintained unchanged, after the editing points IN, OUT and interval are set by the above editing operation. In this case, push the OUT point fixing

- 5 toggle button 810 by using the mouse 206 and the mouse is clicked to turn on the OUT point fixing toggle button 810 (refer to Steps 904 and 905 in Fig. 14).

It is assumed here that the IN point value is increased by three frames.

- 10 The pointer is placed on the IN point display box 801 and the IN point value larger by three frames is entered from the keyboard 205 (refer to Step 906 in Fig. 14).

- The OUT point fixing toggle button 810 is in
15 the on-state and the OUT point value is fixed.
Therefore, as the IN point value is increased by three frames, the remaining item or interval is automatically calculated and the value in the interval display box 803 is changed to a value smaller by three frames (refer to
20 Step 908 in Fig. 14).

- Next, consider for example an editing operation that the IN point is changed and the interval is maintained unchanged, after the editing points IN, OUT and interval are set. In this case, the pointer is
25 placed on the interval fixing toggle button 811 by using the mouse 206 and the mouse is clicked to turn on the interval fixing toggle button 811 (refer to Steps 904 and 905 in Fig. 14).

It is assumed here that the IN point value is increased by three frames. The pointer is placed on the IN point display box 801 and the IN point value larger by three frames is entered from the keyboard 205 (refer to
5 Step 906 in Fig. 14).

The interval fixing toggle button 811 is in the on-state and the interval value is fixed. Therefore, as the IN point value is increased by three frames, the remaining item or OUT point is automatically calculated
10 and the value in the OUT point display box 802 is changed to a value larger by three frames (refer to Step 908 in Fig. 14).

If an additional editing operation is to be performed after the editing points IN, OUT and interval
15 are set once and any fixing toggle button is not turned or, i.e., all the fixing toggle buttons are maintained tuned on, then the remaining item is automatically selected and calculated in accordance with a predetermined priority order (refer to Step 909 in Fig. 14).

20 The item with the turned-on fixing toggle button has a fixed set value of the editing point, so that the system is programmed not to allow the keyboard 205 to enter a value.

In this embodiment, an item whose set value of
25 the editing point is not automatically calculated, i.e., an item whose set value of the editing point is maintained unchanged, is selected. In another embodiment contrary with this embodiment, an item whose set value of

the editing point is automatically calculated by the editing control computer 203, i.e., an item whose set value of the editing point is changed, may be selected.

In this embodiment method, the editing point of
5 the item with the turned-on fixing toggle button is automatically set. Of the three items of editing points including the IN and OUT points and interval, one of the fixing toggle buttons is made always turned on, and all of the buttons cannot take the off-state at a time.

10 Similar to the above embodiment, the item of the turned-on fixing toggle button is programmed in this system so as not to enter a new value from the keyboard.

For example, if the OUT fixing toggle button
810 is on, the OUT point of the editing point is
15 automatically set.

With the moving image editing method of this invention, any item among the IN and OUT points and interval can be selected as desired so that the editing point of moving images of the selected item is not set
20 automatically. A problem that the item not desired to be changed is automatically set upon a change in one item, will not occur.

For example, it is possible to select one of the OUT point and interval when the IN point is changed,
25 in accordance with applications and objects of setting editing points. It is not necessary to enter again the value of an item once set, so that the editing point can be set efficiently.

According to the embodiment of the invention, means is provided for instructing to select either the item whose value is automatically set or the item whose set editing point value is maintained unchanged and is
5 not automatically set. By utilizing this means, a moving image editing method can be provided which can efficiently set editing points.

According to the present invention, the operator can check the image quality of the recorded
10 moving images by monitoring the log image window without reproducing whole moving images from the recording medium, and a re-recording of the desired images can be easily and quickly made.

The video system of the invention is applicable
15 not only to the above embodiments, but also to a system which uses a magnetic tape as a recording medium 210 of the video recording/reproducing apparatus 207.

The invention is not limited only to the above embodiments. It is apparent that various modifications
20 and applications may be made by those skilled in the art from the disclosure of this invention.

WHAT IS CLAIMED IS:

1. An apparatus for detecting abnormality of a video system comprising:

a display device;

means for detecting an abnormality state of said video system in accordance with a moving image reproduced from a video recording medium;

a storage device for storing an image which said abnormality state is detected as a still image; and

display control means for reading said still image which said abnormality state is detected from said storage device; and

display device displaying said still image of said abnormality state on said display device.

2. An apparatus according to claim 1, further comprising:

means for detecting a change point of an image from the reproduced moving image; and

means for generating still images representative of a series of frame images constituting moving images from the change point to a next change point,

wherein said display control means reads both said representative still images and said still image which said abnormality state is detected, and said display device displays said representative still images and said still image having abnormality state in a manner allowing to discriminate said still image having said abnormality state from said representative still images.

3. An apparatus according to claim 2, further comprising:

means for generating the change point and time information of the still image having the abnormality state, wherein said storage device stores the time information in association with the representative still images and the still image of said abnormality state.

4. An apparatus according to claim 3, wherein said display control means includes means for displaying the time information in association with the representative still images and the still image detected as in the abnormality state, on the screen of said display device.

5. An apparatus according to claim 4, wherein said display control means includes means for reproducing moving images from said storage device and displaying the moving images on said display device, as an original position according to the time information, and displaying the reproduced images on the screen of said display device.

6. An apparatus according to claim 1, wherein said means for detecting the abnormality state obtains a correlation of image data between a frame to be detected and an adjacent frame and detects a presence/absence of the abnormality state of an image in accordance with the correlation.

7. An apparatus according to claim 1, wherein said means for detecting the abnormality state divides a frame to be detected, into a plurality of regions, obtains a

histogram of image data in each region, and detects a presence/absence of the abnormality state of an image in accordance with the histogram.

8. An apparatus according to claim 1, wherein said means for detecting the abnormality state detects a state of specific signal components in video signals of a frame to be detected, and detects a presence/absence of the abnormality state of the video system in accordance with the detected state.

9. An apparatus according to claim 1, wherein said means for detecting the abnormality state detects an occurrence of the abnormality state when a same image continues for a predetermined time or longer.

10. An apparatus according to claim 1, further comprising a recording/reproducing apparatus for reading original moving images from a first recording medium storing the original moving images and recording the read original moving images in a second recording medium, wherein said means for detecting the abnormality state detects the abnormality state in accordance with the moving images reproduced from the second recording medium.

11. An apparatus according to claim 10, further comprising means for reproducing the moving image from the recording medium and detecting the abnormality state while recording to original moving image into the recording medium.

12. An apparatus according to claim 10, further

comprising means for reproducing the moving image from the recording medium and displaying results of proceeding of the recording while recording the original moving image into the recording medium.

13. An apparatus according to claim 1, further comprising:

means for setting variables of three variable items including an IN point representative of an editing start position of the moving images, an OUT point representative of an editing end position, and an interval between the editing start point and the editing end point;

means for changing the set value of the variable set by said setting means;

means for designating a fixed variable item whose set value is maintained unchanged, among the variable items whose set values are not changed by said changing means;

means for displaying in an operable manner on the screen said setting means, said changing means, said means for designating the fixed variable item, and the set values; and

means for calculating the set value for the variable item whose set value is not changed by said changing means, wherein said calculating means calculates the set value of a remaining variable item from the changed variable and the set value of the fixed variable item, if the fixed variable item is being designated.

14. A method for detecting an abnormality of a video system, comprising the steps of:

detecting an abnormality state of said video system in accordance with a moving image reproduced from a video recording medium;

storing as an image which said abnormality is detected as a still image in a storage device; and
reading the still image having said abnormality state from said storage device; and

displaying said still image having said abnormality state on a display device.

15. A method according to claim 14, further comprising the steps of:

detecting a change point of an image from the reproduced moving image; and

generating still images representative of a series of frame images constituting moving images from the change point to a next change point,

wherein both said representative still images and the still image having said the abnormality state are displayed on said the display device in a manner allowing to discriminate said still image having said abnormality state from the representative still images.

16. A method according to claim 15, further comprising the step of:

generating the change point and time information of the still image detected as in the abnormality state, and the time information is stored in association

with the representative still images and the still image detected as in the abnormality state.

17. A method according to claim 16, further comprising the step of displaying the time information in association with the representative still images and the still image detected as in the abnormality state, on the screen of the display device.

18. A method according to claim 17, further comprising the step of reproducing moving images from the storage device and displaying the moving images on the screen of the display device, by using the time information as a start position, and displaying the reproduced moving images on the screen of the display device.

19. A method according to claim 14, wherein said step of detecting the abnormality state obtains a correlation of image data between a frame to be detected and an adjacent frame and detects a presence/absence of the abnormality state of an image in accordance with the correlation.

20. A method according to claim 14, wherein said step of detecting the abnormality state divides a frame to be detected, into a plurality of regions, obtains a histogram of image data in each region, and detects a presence/absence of the abnormality state of an image in accordance with the histogram.

21. A method according to claim 14, wherein said step of detecting the abnormality state detects a state

of specific signal components in video signals of a frame to be detected, and detects a presence/absence of the abnormality state of the video system in accordance with the detected state.

22. A method according to claim 14, further comprising the step of reading original moving images from a first recording medium storing the original moving images and recording the read original moving images in a second recording medium, wherein said step of detecting the abnormality state detects the abnormality state in accordance with the moving images reproduced from the second recording medium.

23. A method according to claim 14, further comprising the steps of:

- setting variables of three variable items including an IN point representative of an editing start position of the moving images, an OUT point representative of an editing end position, and an interval between the editing start point and the editing end point;

- changing the set value of the variable set;
- designating a fixed variable item whose set value is maintained unchanged, among the variable items whose set values are not changed;

- displaying values of the variable item set, the variable item changed, and the fixed variable item, on the screen of the display device so as to be able to be designated on the screen; and

calculating the set value for the variable item whose set value is not changed, wherein the value of a remaining variable item is calculated from a variable of the changed variable item and the set value of the fixed variable item, if the fixed variable item is being designated.

24. A computer program product comprising:

a computer usable medium having computer readable program code embodied in said medium for a method for detecting abnormality of a video system,

said computer readable program code means comprising the steps of:

detecting an abnormality state of said video system in accordance with a moving image reproduced from a video recording medium;

storing an image which said abnormality state is detected, as a still image in a storage device;

reading said still image having said abnormality state from said storage device; and

displaying said still image having said abnormality state on a display device.

25. A computer program product according to claim 24, wherein said computer readable program code further comprises the steps of:

detecting a change point of an image from the reproduced moving image;

generating still images representative of a series of frame images constituting moving images from

the change point to a next change point; and

displaying both said representative still images and said still image having said abnormality state on said display device in a manner allowing to discriminate said still image having said abnormality state from said representative still images.

26. A moving image editing system, comprising:

means for setting variables of three variable items including an IN point representative of an editing start position of the moving images, an OUT point representative of an editing end position, and an interval between the editing start point and the editing end point;

means for changing the set value of the variable set by said setting means;

means for designating a fixed variable item whose set value is maintained unchanged, among the variable items whose set values are not changed by said changing means;

a display device for displaying in an operable manner on a screen said setting means, said changing means, said fixed variable item designating means, and the set values; and

means for calculating the set value for the variable item whose set value is not changed, wherein said calculating means calculates the value of a remaining variable item from a variable of the changed variable item and the set value of the fixed variable

item, if the fixed variable item is being designated.

27. A moving image editing system according to claim 26, wherein said fixed variable item designating means can designate only one of the three variable items.

28. A moving image editing system according to claim 26, wherein said fixed variable item designating means fixes a value of the last designated variable item if a plurality of items among the three variable items are designated in succession.

29. A moving image editing method, comprising the steps of:

setting variables of three variable items including an IN point representative of an editing start position of the moving images, an OUT point representative of an editing end position, and an interval between the editing start point and the editing end point;

changing the set value of the variable set;

designating a fixed variable item whose set value is maintained unchanged, among the variable items whose set values are not changed;

displaying values of the variable item set, the variable item changed, and the fixed variable item, on the screen of the display device so as to be able to be designated on the screen; and

calculating the set value for the variable item whose set value is not changed, wherein the value of a remaining variable item is calculated from a variable of the changed variable item and the set value of the fixed

variable item, if the fixed variable item is being designated.

30. A moving image editing method according to claim 29, wherein said step of designating the fixed variable item designates only one of the three variable items.

31. A moving image editing method according to claim 29, wherein said step of designating the fixed variable item fixes a value the last designated variable item if a plurality of items among the three variable items are designated in succession.

32. A computer program product comprising:

a computer usable medium having computer readable program code embodied in said medium for a moving image editing method,

said computer readable program code comprising the steps of:

setting variables of three variable items including an IN point representative of an editing start position of the moving images, an OUT point representative of an editing end position, and an interval between the editing start point and the editing end point;

changing the set value of the variable set;

designating a fixed variable item whose set value is maintained unchanged, among the variable items whose set values are not changed;

displaying values of the variable item set, the variable item changed, and the fixed variable item, on

the screen of the display device so as to be able to be designated on the screen; and

calculating the set value for the variable item whose set value is not changed, wherein the value of a remaining variable item is calculated from a variable of the changed variable item and the set value of the fixed variable item, if the fixed variable item is being designated.

33. A computer program product according to claim 32, wherein said fixed variable item designating step can designate only one of the three variable items.

34. A computer program product according to claim 32, wherein said fixed variable item designating step said computer readable program code means fixes a value of the last designated variable item if a plurality of items among the three variable items are designated in succession.

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ABSTRACT OF THE DISCLOSURE

In a video system for reproducing, recording and editing moving images, an abnormality state of the video system or images is automatically detected from the reproduced images, the reproduced images detected as in the abnormality state is recording as a still image which is displayed on a display screen. In a moving image editing system and method, it is possible to set variables of three variable items including an IN point representative of an editing start position of the moving images, an OUT point representative of an editing end position, and an interval between the editing start point and the editing end point. If the set value of the variable is changed, a fixed variable item whose set value is maintained unchanged, among the variable items whose set values are not changed, is designated so that the value of a remaining variable item can be automatically calculated and set again. A computer program product provides a recording medium storing program code means embodying sequences of the video system use method or editing method in the computer readable format.

FIG.1

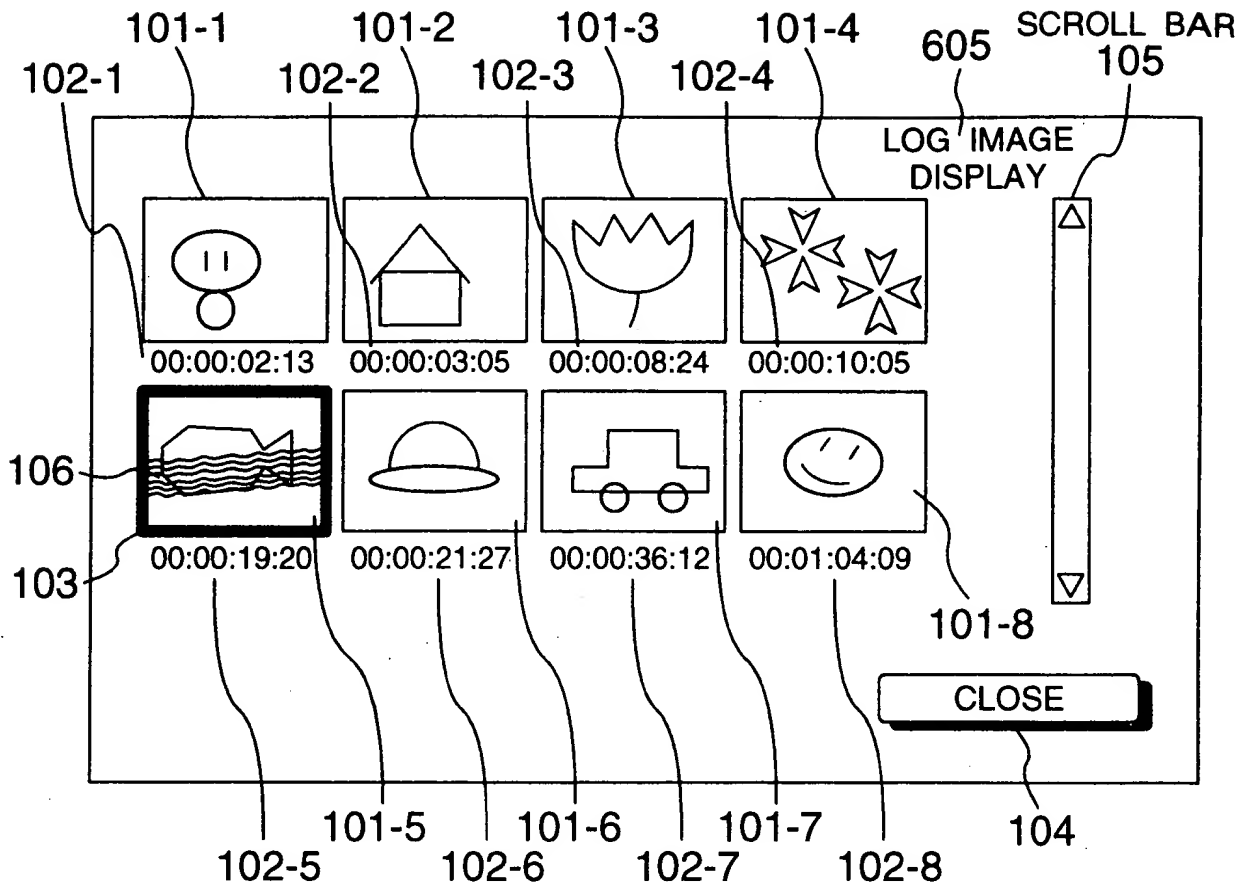


FIG.2

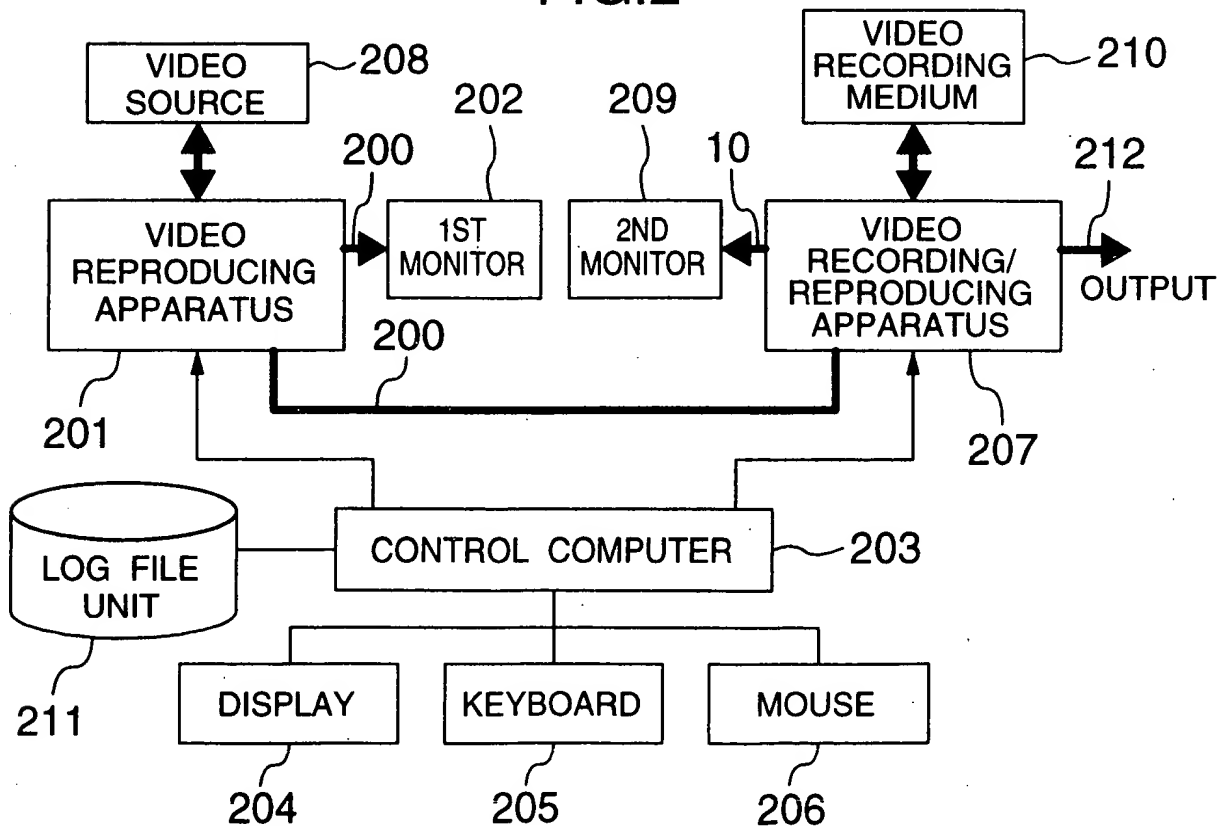


FIG.3

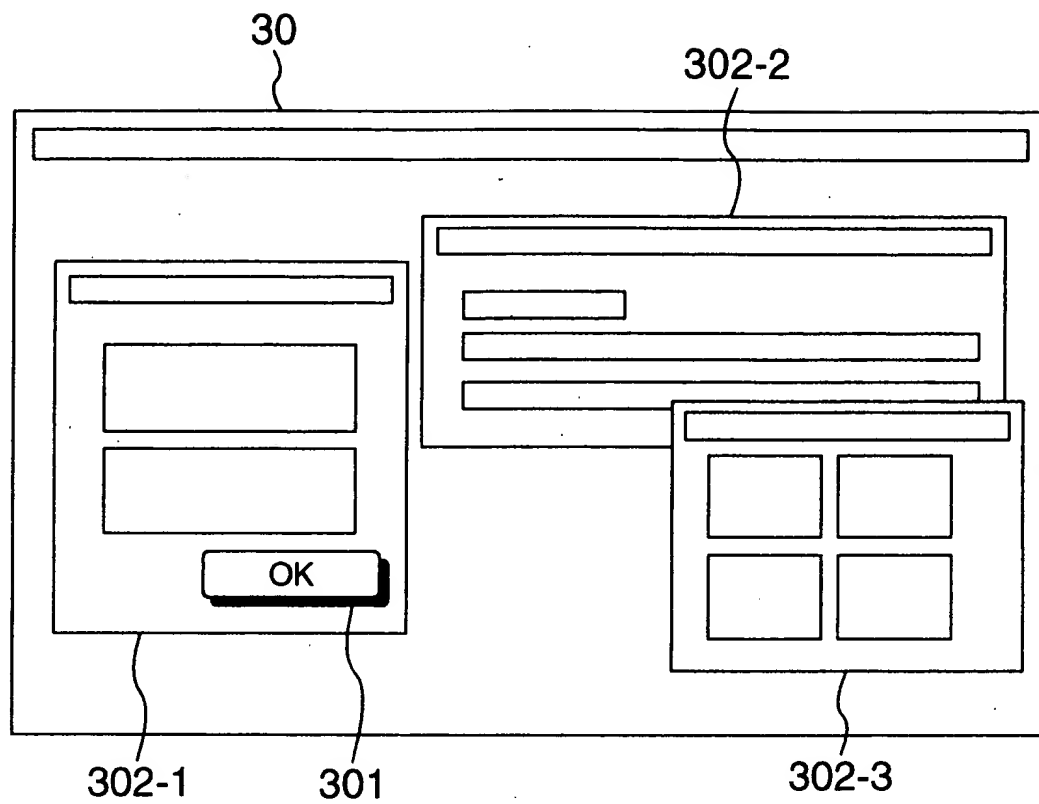


FIG.4

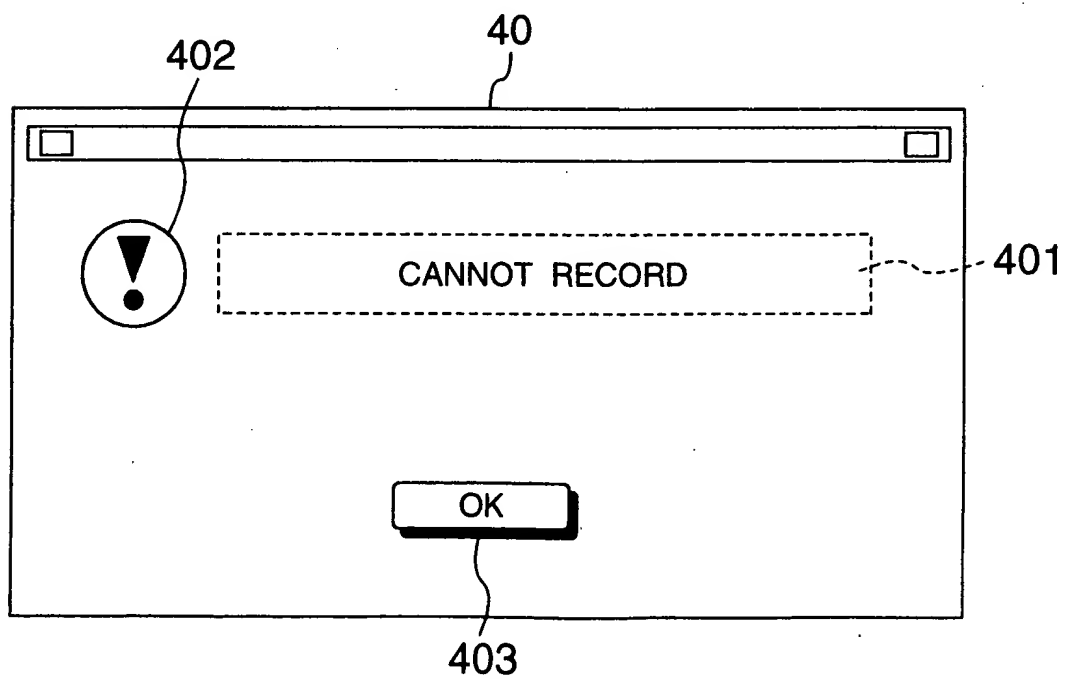


FIG.5

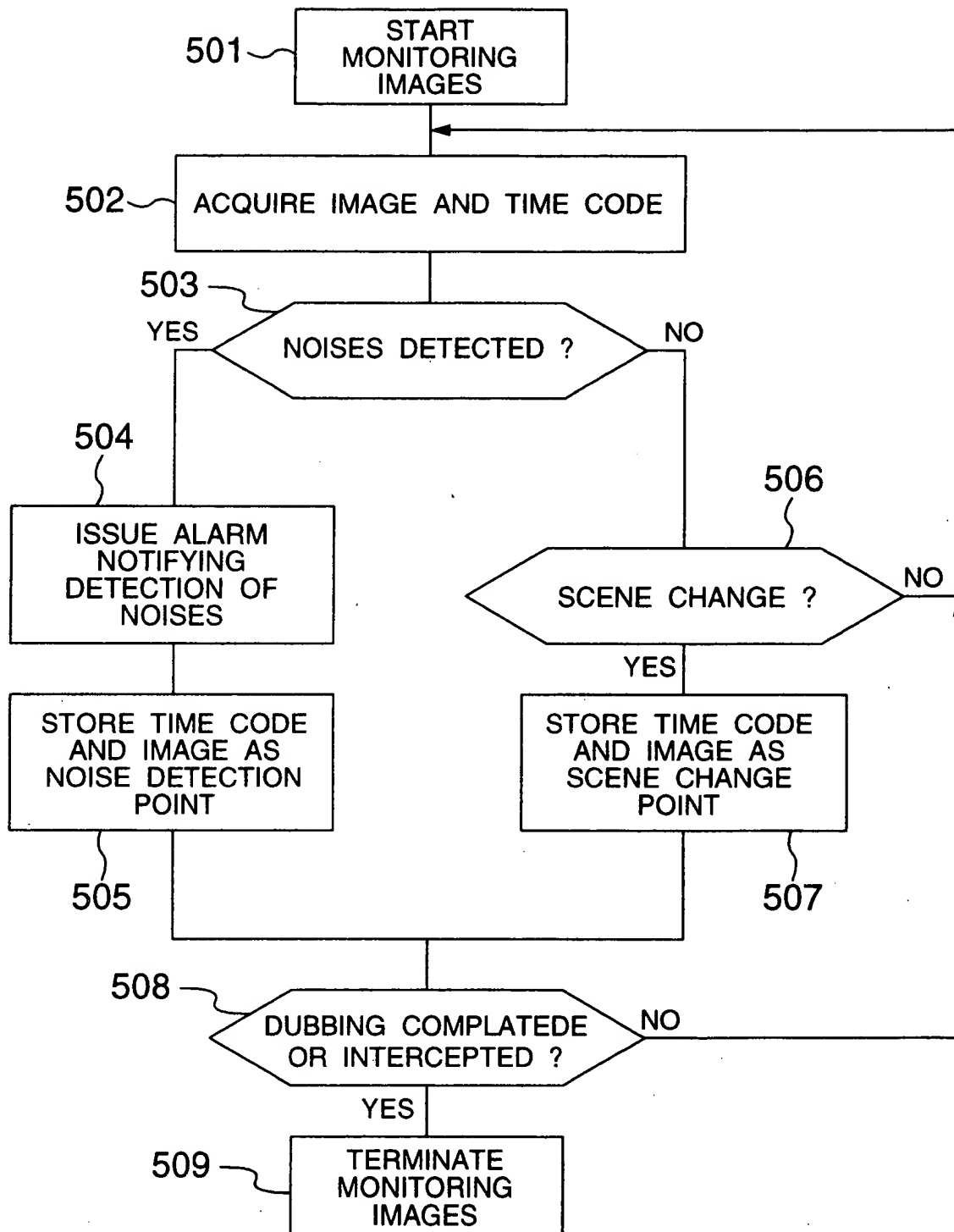


FIG. 6

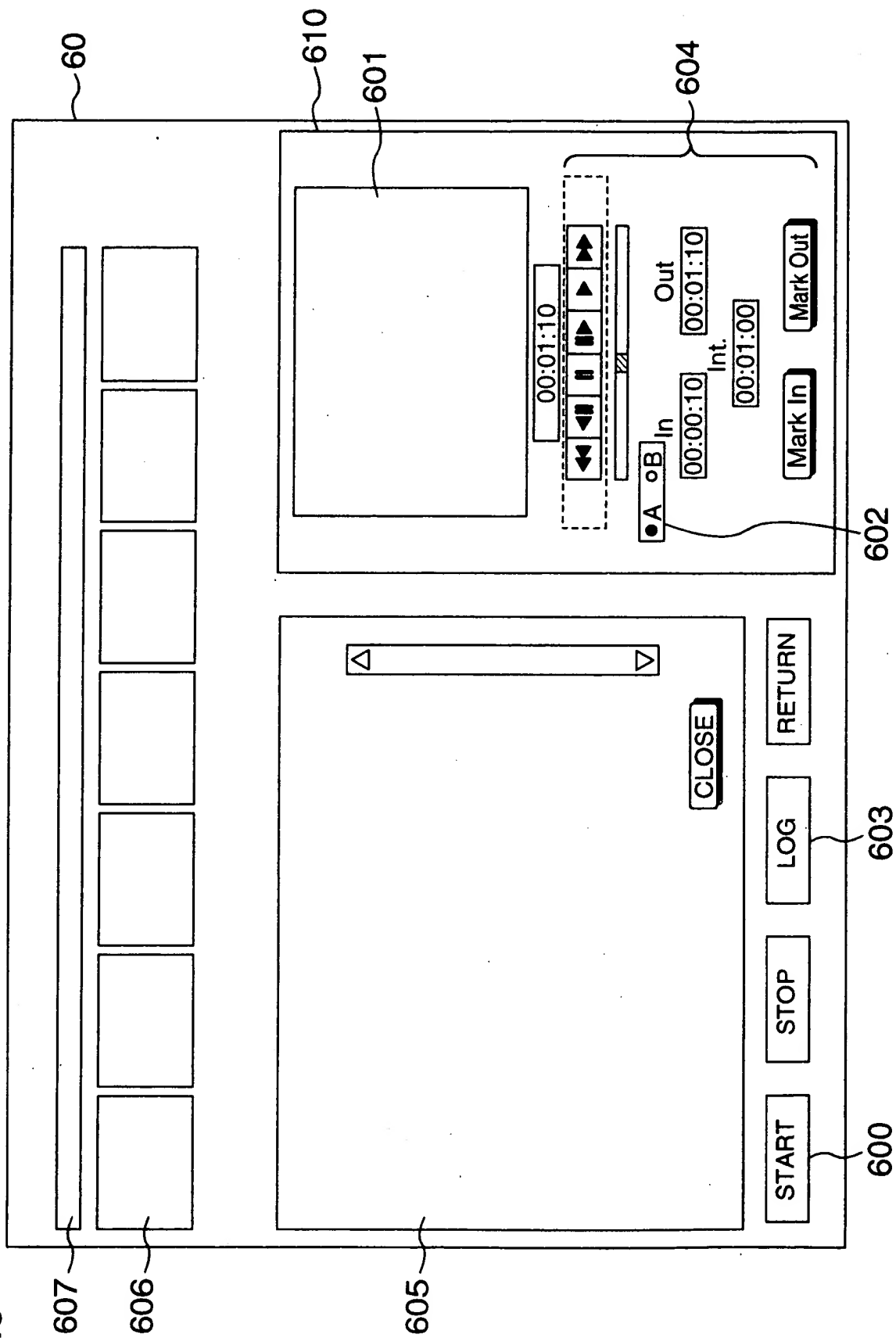


FIG.7

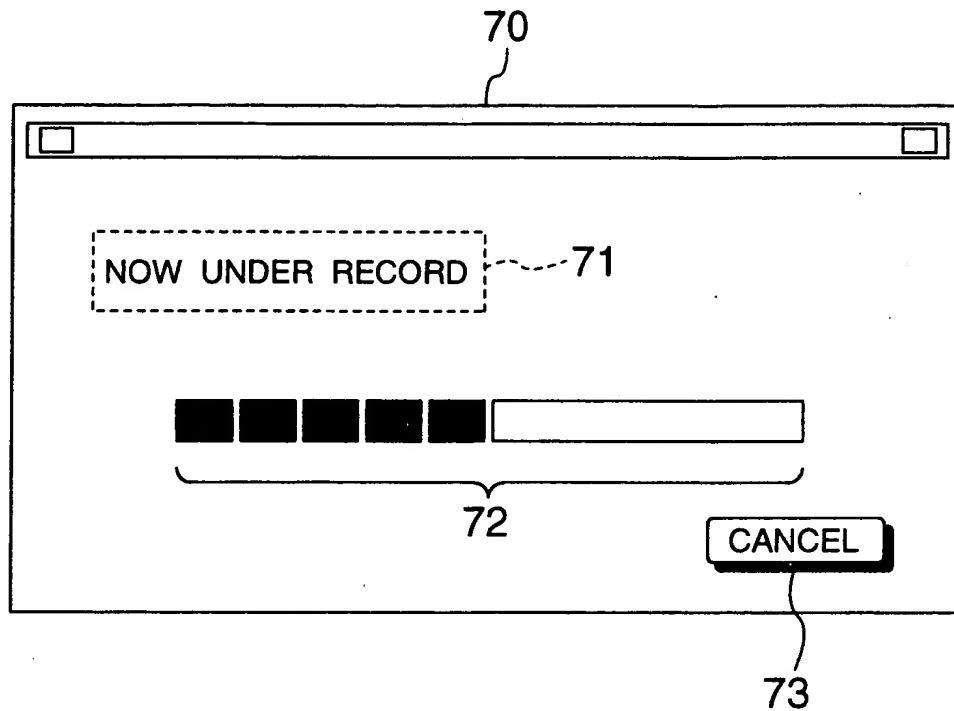


FIG.9

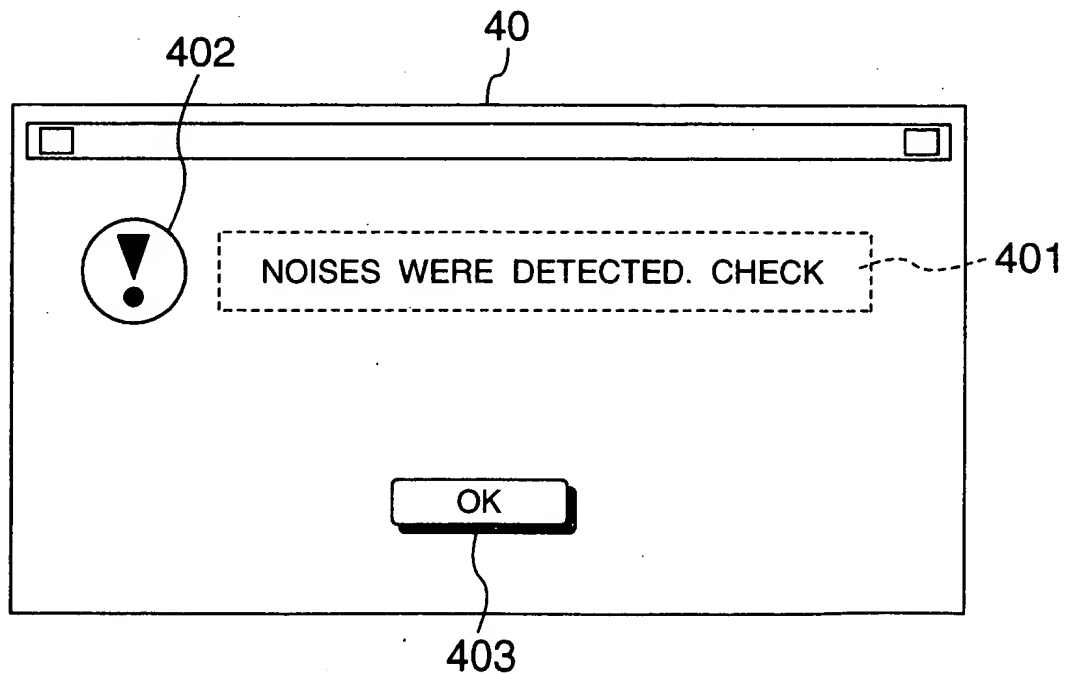


FIG.8

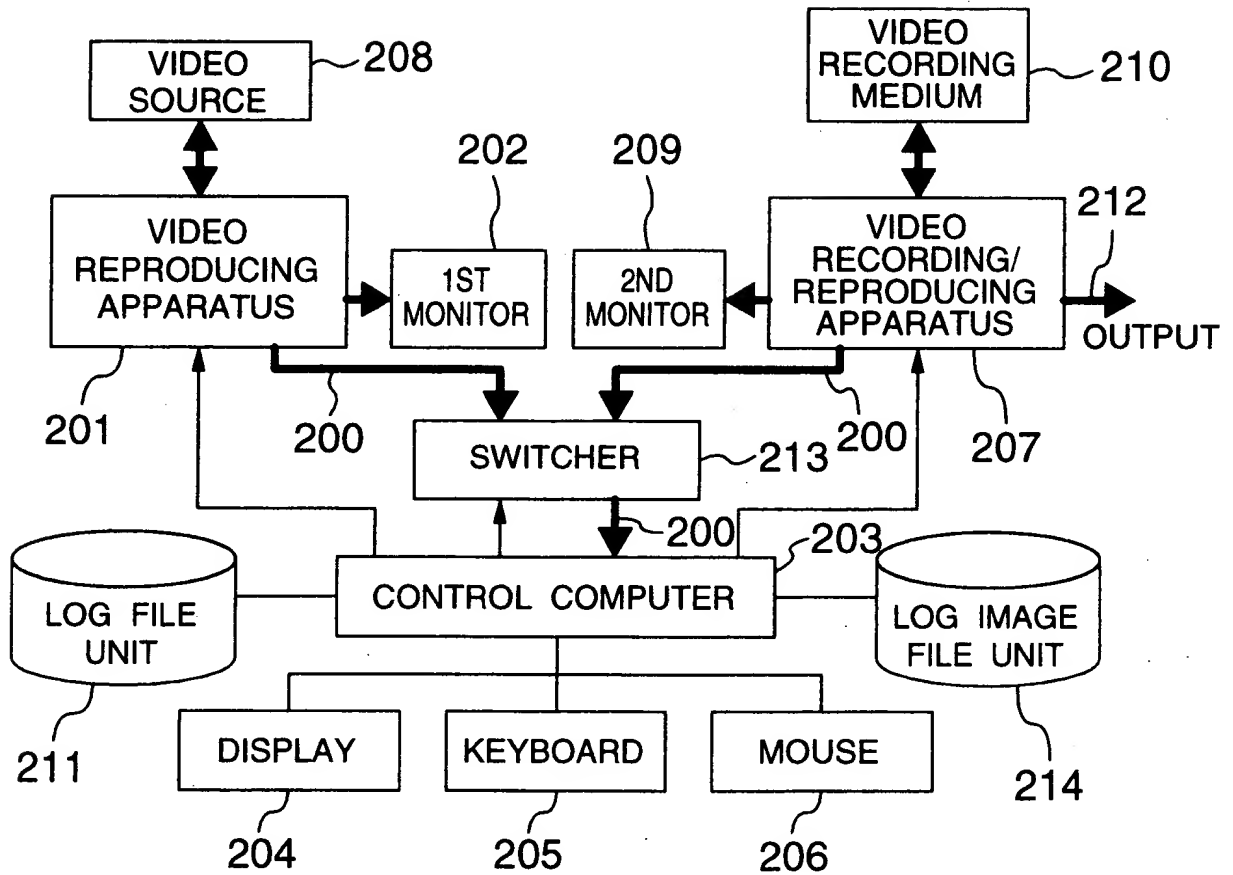


FIG.10

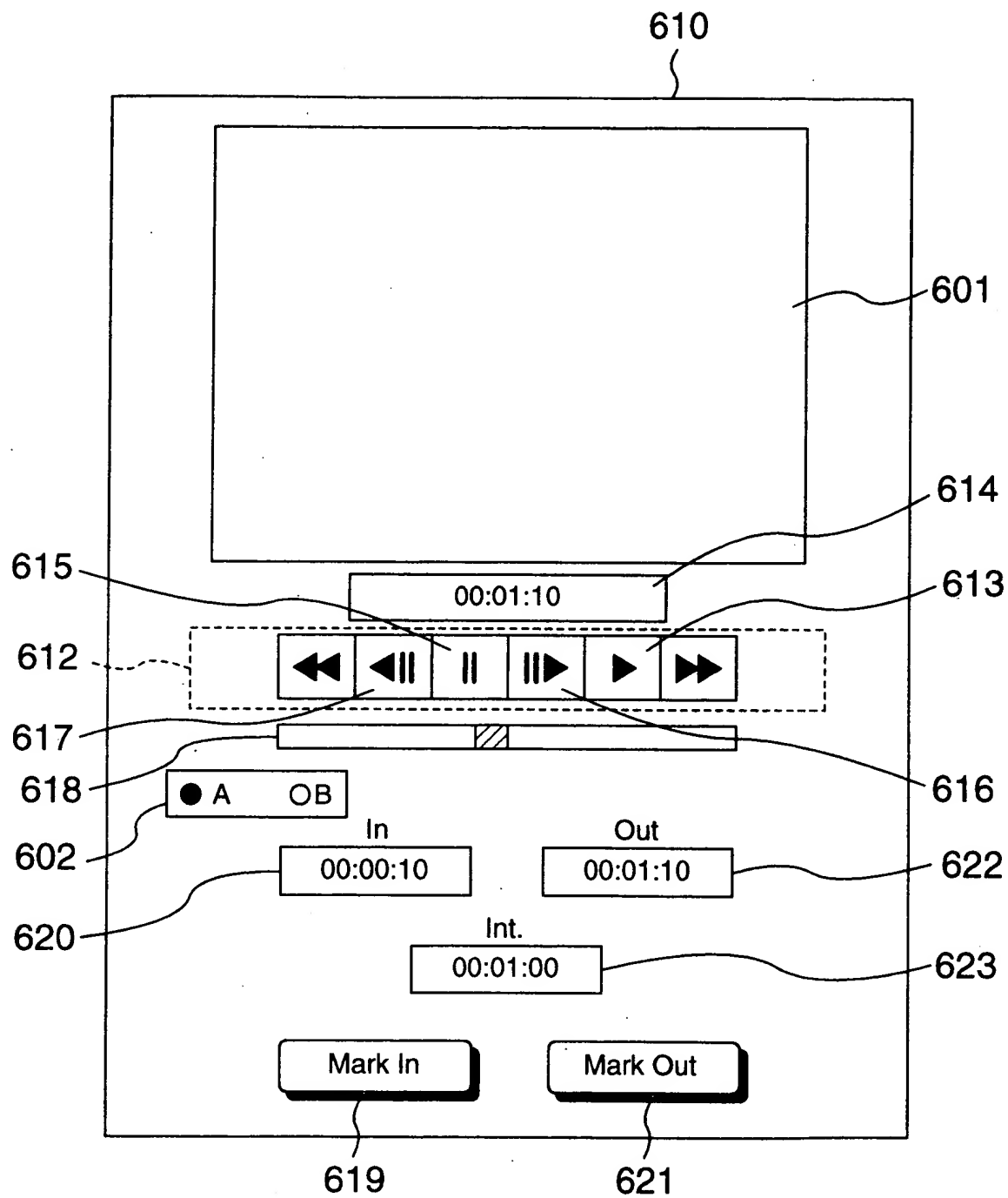


FIG.11

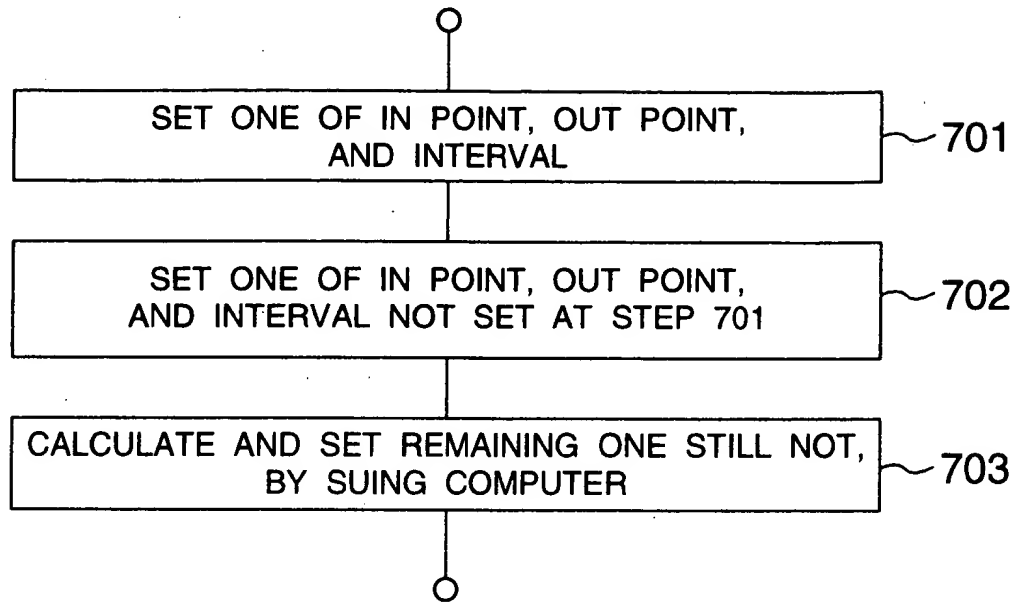


FIG.12

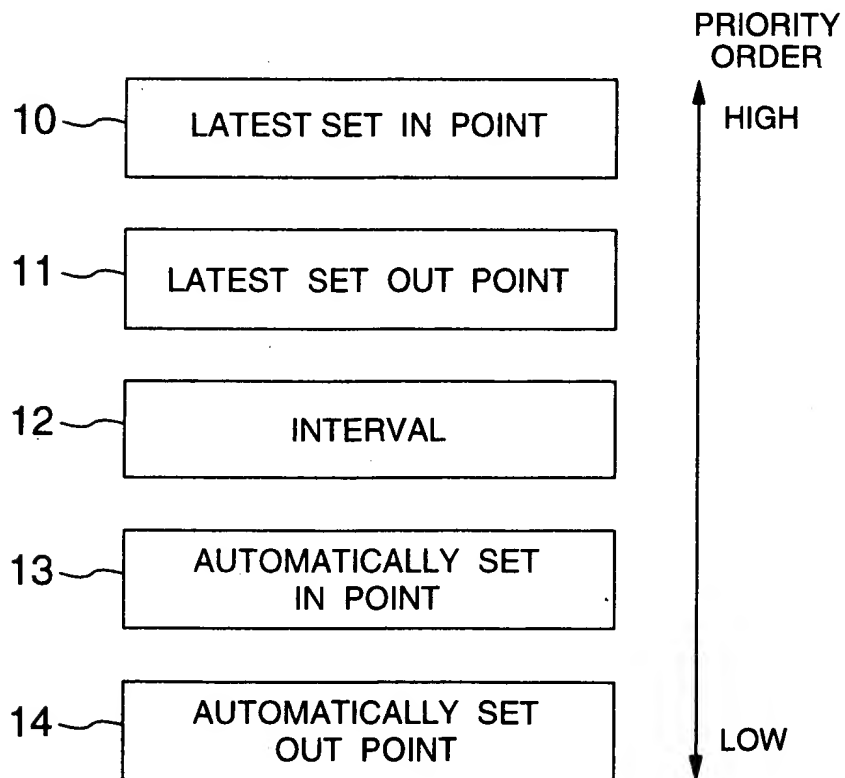


FIG.13

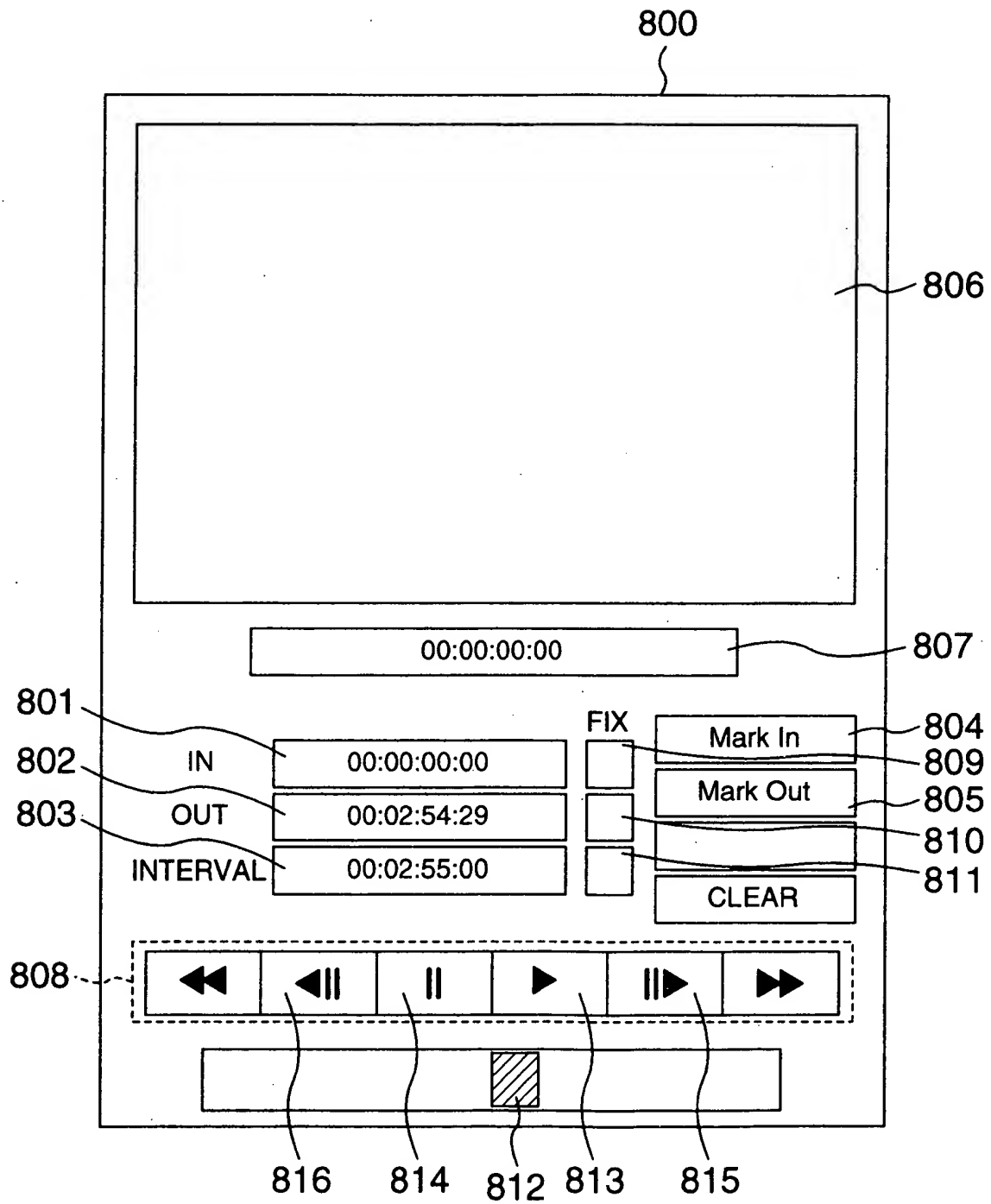


FIG.14

